IN THE CLAIMS:

1. (Currently Amended) A method for generating and detecting ultrasonic surface displacements on a remote target comprising the steps of:

directing a first pulsed laser beam to illuminate a portion of a surface of the remote target with an optical assembly;

generating ultrasonic surface displacements within the illuminated portion of the surface of the remote target with the first pulsed laser beam;

directing a second pulsed laser beam substantially to the illuminated portion of the surface of the remote target, wherein the first pulsed laser beam and second pulsed laser beam are directed to the surface of the remote target ~~with~~ ;

detecting, using the second pulsed laser beam coaxial with first pulsed laser beam, the ultrasonic surface displacements substantially within the illuminated portion of the surface of the remote target;

collecting phase modulated light from the second pulse laser beam either reflected or scattered by the remote target;

processing the phase modulated light to obtain data representative of the ultrasonic surface displacements on the surface of the remote target, wherein the processing is performed with an interferometer self-stabilized with the phase modulated light; and

processing the data representative of the surface displacements to assess the structural integrity of the remote target.

2. (Currently Amended) The method of Claim 1 wherein the step of processing the phase modulated light further comprising the steps of:

demodulating ~~using an interferometer stabilized with the phase modulated light to demodulate~~ the phase modulated light for creating at least one optical signal;

converting the at least one optical signal into at least one digital signal; and

using a digital signal processor to process the at least one digital signal.

3. (Original) The method of Claim 2 wherein the step of converting the at least one optical signal into at least one digital signal further comprising the steps of:

converting the at least one optical signal into at least one analog signal; and

converting the at least one analog signal into at least one digital signal.

4. (Currently Amended) [A] An apparatus for generating and detecting ultrasonic surface displacements on a remote target comprising:

a first pulsed laser to generate a first pulsed laser beam to illuminate a portion of a surface of the remote target and produce ultrasonic surface displacements substantially within the illuminated portion of the surface of the remote target;

a second pulsed laser to generate a second pulsed laser beam coaxial with said first pulsed laser beam, wherein the second pulsed laser beam substantially illuminates the portion of the surface illuminated by the first pulsed laser beam to detect the ultrasonic surface displacements on the surface of the remote target;

a scanning optical assembly operable to direct the first pulsed laser beam and second pulsed laser beam to the surface of the remote target;

collection optics, optically coupled to the scanning optical assembly, operable to collect phase modulated light from the second pulsed laser beam either reflected or scattered by the remote target;

an interferometer self-stabilized with the phase modulated light, wherein the interferometer is operable to process the phase modulated light and generate at least one output signal; and

a processor operable to:

process the at least one output signal to obtain data representative of the ultrasonic surface displacements on the surface of the remote target; and

process the data representative of the surface displacements to assess the structural integrity of the remote target.

5. (Original) The apparatus of Claim 4 further comprising an intensity controller to adjust on a pulse-by-pulse basis the intensity of the second pulsed laser beam in proportion to the intensity of the phase modulated light collected by the collection optics.

6. (Original) The apparatus of Claim 4 wherein the first pulsed laser emits a laser beam of coherent light of about 10 microns in wave length.

7. (Original) The apparatus of Claim 4 wherein the interferometer is self-stabilized using substantially 100% of the phase modulated light delivered to the interferometer by the collection optics.

8. (Original) The apparatus of Claim 4 further comprising an optical ranging unit to calculate a distance by which the remote target is separated from the apparatus.

9. (Currently Amended) A large area composite inspection apparatus for measuring ultrasonic surface displacements on a surface of a remote target comprising:

a detection laser to generate a pulsed laser beam to detect the ultrasonic surface displacements on the surface of the remote target;

a scanning optical assembly operable to scan the pulsed laser beam across the surface of the remote target;

collection optics, optically coupled to the scanning optical assembly for collecting phase modulated light from the pulsed laser beam either reflected or scattered by the remote target;

an interferometer to process the phase modulated light collected by the collection optics, wherein the interferometer is <u>self-</u>stabilized with the collected phase modulated light either reflected or scattered by the remote target;

said interferometer comprising:

a first cavity having a first confocal lens structure; a second cavity having a second confocal lens structure; a device for dividing incoming de-polarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities;

a control system to adjust said first and second cavities such that a ratio of light transmitted through each cavity to light reflected back through each cavity remains substantially constant; and

a processor to process the light transmitted through the first cavity, the light reflected back through the first cavity, the light transmitted through the second cavity, and the light reflected back through the second cavity, all in order to obtain data representative of the ultrasonic surface displacements on the surface of the remote target.

10. (Original) The large area composite inspection apparatus of claim 9 further comprising an intensity controller which adjusts on a pulse-by-pulse basis the intensity of the pulsed laser beam in proportion to the intensity of the phase modulated light collected by the collection optics.

11. (Original) The large area composite inspection apparatus of claim 9 further comprising a positioning apparatus to move the detection laser across the surface of the remote target and then record and index the data detected by the large area composite inspection apparatus.

12. (Original) The large area composite inspection apparatus of claim 9 wherein the positioning apparatus is a gantry positioning apparatus.

13. (Original) The large area composite inspection apparatus of claim 9 further comprising a generation laser to generate a pulsed laser beam to detect generate the ultrasonic surface displacements on the surface of the remote target.

14. (Original) The large area composite inspection apparatus of claim 9 wherein the generation laser and the detection laser coaxially apply laser beams to the surface of the remote target.

15. (Currently Amended) A method for generating and detecting ultrasonic surface displacements in a remote target comprising the steps of:

generating ultrasonic surface displacements in the remote target;

directing a pulsed laser beam to detect the ultrasonic surface displacements on the surface of the remote target;

collecting light from the pulsed laser beam either reflected or scattered by the remote target;

processing the light collected from the remote target using an interferometer, wherein the interferometer is self-stabilized with the collected light;

said interferometer comprising: a first cavity having a first confocal lens structure; a second cavity having a second confocal lens structure; a device for dividing incoming de-polarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities; a control system to adjust said first and second cavities such that a ratio of light transmitted through each cavity to light reflected back through each cavity remains substantially constant; and a plurality of detectors to detect the light transmitted through the first cavity, the light reflected back through the first cavity, the light transmitted through the second cavity, and the light reflected back through the second cavity, all in order to obtain data representative of the ultrasonic surface displacements on the surface of the remote target.

16. (Original) The method of claim 15 further comprising the step of adjusting on a pulse-by-pulse basis the intensity of the pulsed laser beam in proportion to the intensity of the light collected from the remote target.

17. (Original) The method of claim 15 further comprising the step of indexing the detection laser across a surface of the remote target and then recording the data on a point-by-point basis.

18. (Original) The method of claim 15 wherein the step of generating ultrasonic surface displacements in the remote target is accomplished a generation laser beam.

19. (Original) The method of claim 15 wherein the pulsed laser beam and a beam of the generation laser are coaxially applied to the surface of the remote target.

Rejections Under 35 USC § 112

Claims 1, 2 and 3 stands rejected under 35 U.S.C. 112 second paragraph as being indefinite. The applicant respectfully submits that Claim 1 has been amended to overcome this rejection and as such the applicant respectfully requests that examiner withdraw the rejections under 35 U.S.C. § 112 to Claims 1 and dependent Claims 2 and 3 and allow Claims 1 and dependent Claims 2 and 3.

Rejections Under 35 USC § 102

Claim 1 stands rejected under 35 U.S.C. 102(e) as being anticipated by Nikoonahad et al (US 6,108,087). The Examiner states:

Nikoonahad et al. (Nikoonahad hereinafter) shows a non-contact system for measuring film thickness comprising (e.g. Figure 2, column 4, lines 8-60):

directing a first pulsed laser beam to illuminate a portion, of a surface of the remote target with an optical assembly ;

generating ultrasonic surface displacements within the illuminated portion of the surface of the remote target with the first pulsed laser beam;

directing a second pulsed laser beam substantially to the illuminated portion of the surface of the remote target, wherein the first pulsed laser beam and second pulsed laser beam are directed to the surface of the remote target;

detecting, using the second pulsed laser beam coaxial with the first pulsed laser beam, the ultrasonic surface displacements substantially within the illuminated portion of the surface of the remote target;

collecting phase modulated light from the second pulse laser beam either reflected or scattered by the remote target: and

processing the phase modulated light to obtain data representative of the ultrasonic surface displacements on the surface of the remote target.

Applicant respectfully submits that Nikoonahad fails to teach that the interferometer utilized for processing the phase-modulated light is a self-stabilized interferometer as Claimed in Claim 1. Nikoonahad fails to teach the use of a self-stabilized interferometer that uses light from

the target and supplied to the interferometer to stabilize the interferometer. Rather a delayed portion of the original beam is used to stabilize the interferometer of Nikoonahad. Therefore the applicant respectfully submits that the rejection under Nikoonahad is improper and that the present invention can be clearly distinguished from that of Nikoonahad et al. Therefore applicant respectfully requests that the rejections under 35 U.S.C. § 102(e) be withdrawn and allow Claim 1.

Applicants appreciate the time taken by the Examiner to review Applicants' present application. This application has been carefully reviewed in light of the Official Action mailed November 18, 2004. Applicants respectfully request reconsideration and favorable action in this case.

Rejections under 35 U.S.C. § 103

Applicants respectfully point out that in order to combine references for an obviousness rejection, there must be some teaching, suggestion or incentives supporting the combination. *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q. 2d 1397, 1399 (Fed. Cir. 1989). The mere fact that the prior art could be modified does not make that modification obvious unless the prior art suggests the desirability of the modification. *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). In addition, it is well established that Applicant's disclosure cannot be used to reconstruct Applicant's invention from individual pieces found in separate, isolated references. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988).

Claims 2 and 3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nikoonahad as applied to claim 1 above and further in view of Schultz et al (US 5,402,223). The examiner states:

> *Nikoonahad does not show the converting of the analog signals to digital signals. Schultz et al show a furnace control system using an interferometer comprising of converting the detection signals from analog to digital signals. At the time of the invention, one of ordinary skill in the art would have converted the analog signals to digital signals in order to electronically analyze the signals by a computer.*

Applicant respectfully submits that Nikoonahad fails to teach that the interferometer utilized for processing the phase-modulated light is a self-stabilized interferometer as Claimed in Claim 1. Nikoonahad fails to teach the use of a self-stabilized interferometer that uses light from the target and supplied to the interferometer to stabilize the interferometer. Therefore the applicant respectfully submits that the rejection under Nikoonahad is improper and that the present invention can be clearly distinguished from that of Nikoonahad et al.

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Nikoonahad with Schultz. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claims 2 and 3 is respectfully requested.

Applicants further submit that neither Nikoonahad or Schultz alone nor the combination of the two teaches or suggests make obvious the invention recited in Claim 2 and 3 because the cited references fail to depict a generation laser beam and detection laser beam that share a common optical path. Additionally, the cited references fail to teach the use of a self-stabilized interferometer.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claims 2 and 3.

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Nikoonahad as applied to claim 1 above, and further in view of Maris (6,008,906). The examiner states:

> *Nikoonahad shows all the claimed elements but does not show a scanning optical assembly. Maris teaches that a scanning assembly (head) can be used for scanning large objects (column 9, lines 57+). At the time of the invention, one of ordinary skill in the are would have been motivated to use a scanning optical assembly in order to be able to scan large objects.*

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Nikoonahad with Maris. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claim 4 is respectfully requested.

Applicants further submit that neither Nikoonahad or Maris alone nor the combination of the two teaches or suggests make obvious the invention recited in Claim 4 because the cited references fail to teach the use of a self-stabilized interferometer.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claim 4.

Claim 5 stands rejected under 35 U.S.C, 103(a) as being unpatentable over Nikoonahad and Maris '906 as applied to claim 4 above, further in view of Siu et al (6,181,431). The examiner states:

> *Nikoonahad does not expressly show the intensity controller. Siu et al show ultrasonic evaluation system comprising a controlled pulsed laser. At the time of the invention, one of ordinary skill in the art would have used a controller for the laser in order to control the magnitude and pulse of the laser.*

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Nikoonahad and Maris with Siu. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claim 5 is respectfully requested.

Applicants further submit that neither Nikoonahad, Maris and Siu alone nor any combination of the three teaches or suggests make obvious the invention recited in Claim 5 because the cited references fail to depict a generation laser beam and detection laser beam that share a common optical path, use a self stabilized interferomter, and that use the generation and detection laser beam to assess the internal structure of the remote target. Further, Siu teaches that the power of the laser used to generate the ultrasound may be controlled. This is done "to prevent material ablation" (Siu, Col. 6, Lines 33-34) The present invention adjusts the detection laser to improve the received signal.

The invention, as claimed in amended Claim 1 from which Claim 5 depends, requires that the first and second beam illuminate substantially the same location on the surface. SIU teaches that the generation laser may be adjusted to prevent material ablation, while applicants claim that

the detection laser may be adjusted to improve the received signal. Therefore, the cited prior art fails to mention any such arrangement.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claim 5.

Claim *6 stands rejected* under 35 U.S.C. 103(a) as being unpatentable over Nikoonahad and Maris '906 as applied to claim 4 above, further in view of Maris (5,706,094). The examiner states:

> *Nikoonahad does not expressly show the wavelength of the laser beam. Maris shows an ultrafast optical technique for the characterization of altered materials comprising of a pulsed laser source having a wavelength of about 10 microns. At the time of the invention, one of ordinary skill in the art would have used a pulsed laser having a wavelength of about 10 microns since Nikoonahad is silent about the wavelength and Maris suggests that the wavelength should be about 10 microns.*

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Nikoonahad with Maris. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claim 6 is respectfully requested.

Applicants further submit that neither Nikoonahad or Maris alone nor the combination of the two teaches or suggests make obvious the invention recited in Claim 4 because the cited references fail to teach the use of a self-stabilized interferometer.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claim 6.

Claims 7 and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nikoonahad and Maris as applied to claim 4 above, and further in view of Monchalin et al (US 5,080,491). The examiner states:

> *Nikoonahad and Maris show all the elements but does not show the stabilization using the light from the target. Monchalin et al (Monchalin hereinafter) show for example in Figure 6, the stabilization using the light from the target. At the time of the invention, one of ordinary skill in the art would have modified Nikoonahad*

and Maris to use the stabilization method of Monchalin in order to allow ultrasound detection that is immune from intensity fluctuations of the laser and perturbations on the object surface (Abstract).

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Nikoonahad with Maris. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claim 7 and 8 is respectfully requested.

Applicants further submit that neither Nikoonahad or Maris alone nor the combination of the two teaches or suggests make obvious the invention recited in Claims 7 and 8 because the cited references fail to teach the use of a self-stabilized interferometer.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claims 7 and 8.

Claims 9, 11-13, 15, 17, and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Monchalin in view of Maris (6,008,906). The examiner states:

Monchalin shows a laser optical ultrasound detection using two interferometers comprising:

a detection laser to generate a pulsed laser beam to detect the ultrasonic surface displacements on the surface of the remote target; collection optics for collecting phase

modulated light from the pulsed laser beam either reflected or scattered by the remote target;

an interferometer to process the phase modulated light collected by the collection optics, wherein

the interferometer is stabilized with the collected phase modulated light either reflected or

scattered by the remote target (figure 6); said interferometer comprising:

a first cavity (97) having a first confocal lens structure; a second cavity (99) having a second confocal-lens structure; a device (91, 93) for dividing incoming de-polarized light into a first polarized light component and a second polarized light

component wherein said device also directs said first and second polarized light components into the first and second cavities;

a control system (117, 119) to adjust said first and second cavities such that a ratio

of light transmitted through each cavity to light reflected back through each cavity

remains substantially constant.

Monchalin does not expressly show the processor but shows the light transmitted through the first cavity, the light reflected back through the first cavity, the light transmitted through the second cavity, and the light reflected back through the second cavity, all in order to obtain data representative of the ultrasonic surface displacements on the surface of the remote target. Processors are well known and at the time of the invention, one of ordinary skill in the art would have used a processor to analyze the signals.

Monchalin shows all the claimed elements but does not show a scanning optical assembly. Maris '906 teaches that a scanning assembly (head) can be used for scanning large objects (column 9, lines 57+), At the time of the invention, one of ordinary skill in the are would have been motivated to use a scanning optical assembly in order to be able to scan large objects.

With regards to the moving of the laser or the sample of claims 11, 12, and 17, it is well known to move either the sample or the target in order to scan the sample completely rather than just a single spot, and one of ordinary skill would have done so in order to evaluate the whole sample.

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Monchalin with Maris. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claims 9, 11-13, 15, 17, and 18 is respectfully requested.

Applicants further submit that neither Monchalin or Maris alone nor the combination of the two teaches or suggests make obvious the invention recited in Claims *9,* 11-13, 15, 17, and 18 because the cited references fail to teach the use of a self-stabilized interferometer.

The applicant submits that the interferometer of Monchalin is stabilized with phase-modulated light that is collected from the remote target but not supplied to the interferometer. The present invention can be distinguished from Monchalin, because the present invention uses an interferometer that is self-stabilized using light collected from the target and supplied to the interferometer. In Figure 6 of Monchalin, Element 115 is used to take a portion of the collected light reflected or scattered from the target and then use this to stabilize the interferometers. This light is not supplied to the interferometer. Thus the available signal detected by the interferomter is reduced. The present invention does not require a separate detector to stabilize the interferometer. Monchalin utilizes a separate detector, detector 115, to sample a portion of the collected light in order to provide a signal, external to the interferomoters, to stabilize the interferometers. The interferometers of the present invention are self-stabilized and do not rely on a separate detector but rather are able to be stabilized based solely on the scattered light received at the interferometers. Thus more collected light is available for optical processing resulting in improved signal to noise ratios of the detected signals.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claims 9, 11-13, 15, 17, and 18.

Claim 10 and 16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Monchalin and Maris '906 as applied to claim *9* and 15 above, further in view of Siu et al. The examiner states:

Monchalln does not expressly show the intensity controller. Siu el al show ultrasonic evaluation system comprising a controlled pulsed laser. At the time of the

invention, one of ordinary skill in the art would have used a controller for the laser in order to control the magnitude "and pulse of the laser.

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Monchalin with Siu. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claims 10 and 16 is respectfully requested.

Applicants further submit that neither Monchalin or Siu alone nor the combination of the two teaches or suggests make obvious the invention recited in Claims 10 and 16 because the cited references fail to teach the use of a self-stabilized interferometer.

The applicant submits that the interferometer of Monchalin is stabilized with phase-modulated light that is collected from the remote target but not supplied to the interferometer. The present invention can be distinguished from Monchalin, because the present invention uses an interferometer that is self-stabilized using light collected from the target and supplied to the interferometer. In Figure 6 of Monchalin, Element 115 is used to take a portion of the collected light reflected or scattered from the target and then use this to stabilize the interferometers. This light is not supplied to the interferometer. Thus the available signal detected by the interferomter is reduced. The present invention does not require a separate detector to stabilize the interferometer. Monchalin utilizes a separate detector, detector 115, to sample a portion of the collected light in order to provide a signal, external to the interferomoters, to stabilize the interferometers. The interferometers of the present invention are self-stabilized and do not rely on a separate detector but rather are able to be stabilized based solely on the scattered light received at the interferometers. Thus more collected light is available for optical processing resulting in improved signal to noise ratios of the detected signals.

The applicant respectfully submits that Siu teaches that the power of the laser used to generate the ultrasound may be controlled. This is done "to prevent material ablation" (Siu, Col. 6, Lines 33-34) The present invention adjusts the detection laser to improve the received signal.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claims 10 and 16.

Claims 14 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,128,081) in view of Monchalin and Maris '906. The examiner states:

> *White et al show a method and system for measuring a physical parameter wherein the generation laser and the detection laser coaxially apply laser beams to the surface of the remote target. White et al does not show the interferometer comprising: a first cavity (97) having a first confocal lens structure; a second cavity (99) having a second confocal lens structure; a device (91, 93) for dividing incoming de-polarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities.*
>
> *Monchalin shows an interferometer (for example in Figure 6) used for measuring the surface characteristics comprising: an interferometer to process the phase modulated light collected by the collection optics; said interferometer comprising: a first cavity (97) having a first confocal lens structure; a second cavity (99) having a second confocal lens structure; a device (91, 93) for dividing incoming de-polarized light into a first polarized light component and a second polarized light component wherein said device also directs said first and second polarized light components into the first and second cavities; a control system (117, 119) to adjust said first and second cavities such that a ratio of light transmitted through each cavity to light reflected back through each cavity remains substantially constant.*
>
> *Monchalin does not expressly show the process but shows the light transmitted through the first cavity, the light reflected back through the first cavity, the light transmitted through the second cavity, and the light retlected back through the second cavity, all in order to obtain data representative of the ultrasonic surface displacements on the surface of the remote target, Processors are well known and at the time of the invention, one of ordinary skill in the art would have used a processor to analyze the signals.*
>
> *At the time of the invention, one of ordinary skill in the art would have modified White et al to use the interferometer of Monchalin in order to allow*

ultrasound detection that is immune from intensity fluctuations of the laser and perturbations on the object surface (Abstract).

Maris teaches that a scanning assembly (head) can be used for scanning large objects (column 9, lines 57+). At the time of the invention, one of ordinary skill in the are would have been motivated to use a scanning optical assembly in order to be able to scan large objects.

The applicant submits that the interferometer of Monchalin is stabilized with phase-modulated light that is collected from the remote target but not supplied to the interferometer. The present invention can be distinguished from Monchalin, because the present invention uses an interferometer that is self-stabilized using light collected from the target and supplied to the interferometer. In Figure 6 of Monchalin, Element 115 is used to take a portion of the collected light reflected or scattered from the target and then use this to stabilize the interferometers. This light is not supplied to the interferometer. Thus the available signal detected by the interferomter is reduced. The present invention does not require a separate detector to stabilize the interferometer. Monchalin utilizes a separate detector, detector 115, to sample a portion of the collected light in order to provide a signal, external to the interferomoters, to stabilize the interferometers. The interferometers of the present invention are self-stabilized and do not rely on a separate detector but rather are able to be stabilized based solely on the scattered light received at the interferometers. Thus more collected light is available for optical processing resulting in improved signal to noise ratios of the detected signals.

Applicants respectfully submit that Monchalin fails to:

> *"provide the ability to perform with high signal-to-noise-ratios (SNR) at large distances from typically very dark composite materials using small aperture high-speed optical scanning methods. The ability to operate in such a mode has the distinct advantage of increasing the optical scan area coverage and providing substantially improved depth-of-field thereby eliminating the need for active focusing mechanisms.*

> *[Monchalin does] not posses the desirable feature of removing common-mode noise from the laser signals using a fully self-referenced interferometric configuration that uses all of the available light without the use of separate stabilization measurements.*
>
> *Another limitation associated with ... Monchalin and other known apparatuses relates to their inability to operate at very high scan rates and process ultrasonic data in real-time. This limitation makes such apparatuses only marginally useful for testing and evaluating composite materials." (10/634,342, Page 4, Line 8 – Page 5, Line 13)*

Additionally, Monchalin and White each fail to use a portion of the phase modulated light provided to the interferomter to stabilize the interferometer. Applicants' invention is stabilized using only the phase modulated light collected by the collection optics and supplied to the interferometer. (10/634,342, Page 19, lines 25-29) This increases the over all signal-to-noise ratio (SNR) of the output signal of the interferometer by eliminating the need for a portion of the detection signal to be used to stabilize the interferometer.

Applicants respectfully submit that there is no motivation, teaching or suggestion to combine Monchalin, Maris and White. Therefore, the rejection on a combination of these references is inappropriate. Withdrawal of the rejection allowance of Claims 14 and 19 is respectfully requested.

Applicants further submit that neither White et al, Monchalin and Maris alone nor any combination of the three teaches, suggests, or make obvious the invention as recited because the cited references fail to depict a self stabilized interferometer.

Applicants, therefore, respectfully request the Examiner to reconsider and withdraw the rejection to allow Claims 14 and 19.